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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,416	11/19/2003	Young-Rag Do	1568.1071	9181
49455	7590	11/17/2005	EXAMINER	
STEIN, MCEWEN & BUI, LLP 1400 EYE STREET, NW SUITE 300 WASHINGTON, DC 20005			KEANEY, ELIZABETH MARIE	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/715,416

Applicant(s)

DO ET AL.

Examiner

Elizabeth Keane

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,10-17 and 19-22 is/are rejected.
- 7) ☒ Claim(s) 3,9 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/19/03; 10/29/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I in the reply filed on 26 August 2005 is acknowledged. The traversal is on the ground(s) that no references have been cited to show that the restriction is necessary and references containing both product and method claims would be found in the same field of technology. This is not found persuasive because no reference to prior art is necessary to require a restriction. Further, while the method and device may be of the same overall field of technology, the search is divergent and the search of the method is not required for the device. This provides the Examiner with an undue burden.

The requirement is still deemed proper and is therefore made FINAL.

Claim 23 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Group II, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 26 August 2005.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2 and 13 are considered indefinite insofar as a plurality of dots cannot have a cylindrical shape. The geometric shape of a dot is two-dimensional and the geometric shape of a cylinder is three-dimensional. Therefore, the terms "dot" and "cylindrical" cannot be used to describe the same shape, it must either be one or the other.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,4,10,11,12,19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Levinson (US Patent 4,774,435).

Re claims 1 and 12: Levinson discloses, in figure 2 and throughout the disclosure, an electroluminescent display device comprising:

- a substrate (30);

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- a corrugated structure formed on the substrate (column 1, lines 48-49), wherein the corrugated structure disperses light through diffraction and reflection (column 3, lines 42-65); and
- a first electrode layer (31), a first insulation layer (32), a fluorescent layer (33), a second insulation layer (34) and a second electrode layer (35) sequentially formed on the substrate to follow the shape of the corrugated structure (column 3, lines 42-45).

The Examiner notes that while Levinson uses the term phosphor to describe luminescent layer, the layer is further defined as zinc sulfide with an activator of manganese. Zinc sulfide activated with manganese is a well-known fluorescent material rather than a phosphorescent material, as evidenced by Atarashi et al. (US Patent 6,666,991) (column 7, lines 34-35).

Re claim 4: Levinson discloses the corrugated structures formed on the inside surface of the substrate (30) therefore, since they are made of the same material, they would have the same refractive index as the substrate.

Re claims 10 and 19: Levinson discloses the fluorescent layer having a higher refractive index than the adjacent first and second insulation layers (column 3, lines 1-4).

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Re claims 11 and 20: Levinson discloses a fluorescent layer of zinc sulfide activated with manganese (column 2, lines 38-40), therefore Levinson discloses a sulfide having a refractive index of more than 1.6 as a base material.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2,5,6,7,8,13,14,15,16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levinson as applied to claims 1 and 12 above, and further in view of Ito et al. (US Patent 6,677,703; hereinafter Ito).

Re claims 2 and 13: Levinson teaches all the features as shown above.

However, Levinson fails to teach or fairly suggest any specific shape of the rough, non-planar surface.

One of ordinary skill in the art would recognize that the shape of the corrugated structure depends upon the desired reflective and dispersion properties. Therefore, the geometric shape of the corrugated structure is merely a matter of design, as further evidenced by Ito (figure 5, column 9, line 62-column 10, line 18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a corrugated structure having a cylindrical shape or a

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polygonal cone shape within the device of Levinson because it maximizes the light absorbed by the fluorescent layer thereby necessitating less fluorescent material in the device and improving the clarity of the image produced by the display.

Re claims 5 and 14: Levinson discloses the substrate material to be silicon dioxide (column 2, line 28).

Re claims 6 and 15: Ito discloses a pitch between the corrugating members of the corrugated structure is $\lambda/4$ to 4λ of a wavelength of light produced from the fluorescent layer (column 9, lines 8-44).

Re claims 7 and 16: Ito discloses the pitch between the corrugating members of the corrugated structure to be in the range of 100-2400nm (column 9, line 44).

Re claims 8 and 17: Ito discloses the minimum height of the corrugating members to be 1.5 times the maximum pitch (column 11, line 38). For example, when the maximum pitch is 250nm (column 9, line 44), the minimum height would be $1.5 \times 250\text{nm} = 375\text{nm}$ which is within the range of 50-1000nm.

Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levinson as applied to claim 12 above, and further in view of Yamazaki (US Patent 6,433,487).

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Re claim 21: Levinson teaches all the features as shown above.

However, Levinson fails to teach or fairly suggest a thin film transistor layer driving the first electrode layer and the second electrode layer.

Yamazaki discloses, in figures 1 and 2 and throughout the disclosure, the use of a corrugated structure within an EL device in which a thin film transistor layer drives a first and second electrode layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the structure of Levinson within the device of Yamazaki because it maximizes clarity of the image produced by the device without increasing power consumption.

Re claim 22: Yamazaki discloses, in figure 2 and throughout the disclosure, a fluorescent layer comprising red, green and blue layers formed in a predetermined pattern, and being formed between the first and second electrode layer, the first and second electrode layers also formed in a predetermined pattern (column 7, lines 59-64).

Allowable Subject Matter

Claims 3,9 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The following is a statement of reasons for the indication of allowable subject matter:

Re claim 3: The best prior art of record discloses an EL device comprising many of the features of the claimed invention, including a corrugated structure. However, the prior art fails to teach or fairly suggest an EL device wherein the corrugated structure comprises a thin-film layer having a plurality of holes formed in a predetermined pattern, as claimed in claim 3.

Re claims 9 and 18: The best prior art of record discloses an EL device comprising many of the features of the claimed invention, including a corrugated structure having various geometries. However, the prior art fails to teach or fairly suggest an EL device wherein the shape of the top surface of the corrugated structure is a circle, and a relationship between a diameter of the circle and a pitch between the structures satisfies a formula of $0.05 < 2 \cdot D/P < 0.5$, wherein D and P represent the diameter and pitch, respectively, as claimed in claims 9 and 18.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following disclose the current state of the art:

- US Patents 4,792,500, 5,936,347, 6,181,063, 6,392,338, 5,352,543, 6,833,667 and 6,898,018.

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- US Patent Publication Applications 2004/0227462 and 2004/0227462.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Keaney whose telephone number is (571)272-2489. The examiner can normally be reached on Monday, Tuesday, Thursday, Friday 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571)272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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SUPERVISORY PATENT EXAMINER